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Chap. SF 523

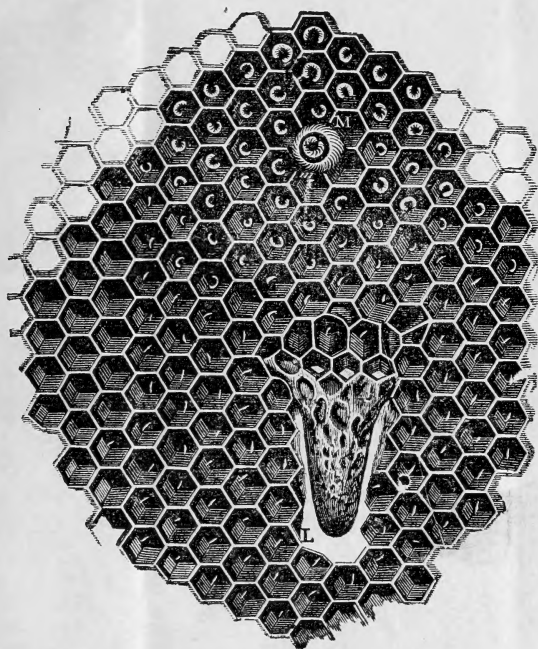
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UNITED STATES OF AMERICA.





AN
IMPROVED SYSTEM
OF PROPAGATING
THE HONEY BEE.



BY J. S. HARBISON.

SACRAMENTO:
PRINTED AT THE DEMOCRATIC STANDARD OFFICE.

1860.

The Trade supplied by HOSSACK & CRAWFORD, Sacramento.

To All to whom these Presents shall come, Greeting:

WHEREAS I, JOHN S. HARBISON, of *Sacramento, California*, did on the *Thirteenth* day of *December*, 1859, obtain Letters Patent for the invention of a new and useful improvement in **BEE HIVES**, vesting in me the sole and exclusive right to make, use, and vend, and to convey to others the right to make, use, and vend, said improvement in *Bee Hives* :

NOW, THEREFORE, be it known, that for the consideration of One Dollar to me paid, the receipt of which I hereby acknowledge, I hereby grant, bargain and sell, unto

.....
of the County of and
State of, the right to
make and use said improvement, for his own personal use,
but not to sell or transfer to any other person ; and as a
condition precedent to the making and use of said improve-
ment, the said grantee shall cause the above blanks to be
filled with his own name, and the name of the County and
State in which he resides.

IN WITNESS WHEREOF, I have hereunto set my hand and
seal, this *15th* day of *Sept* 186*0*

J. S. Harbison





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ENTERED, according to Act of Congress, in the year one thousand eight hundred
and sixty,

BY J. S. HARBISON,

In the Clerk's Office of the District Court of the United States, for the Northern
District of California.

PREFACE.

It is with pleasure that I am enabled to announce to the public the discovery of a new and important improvement in the art of propagating the HONEY BEE. And having verified its practical utility by extensive use both in the *apiaries* of several practical bee-keepers in this State, and in all our own apiaries during the past two seasons, I now call the attention of the public to the merits claimed for it, as well as the instructions for its practical operation, contained in the following pages.

My invention refers to the rearing of queens, and consists in placing the comb known as worker cells, in a horizontal position, so that the cells shall be vertical, or nearly so, by the means hereinafter described.

This vertical position tends to facilitate the labors of the bees in the construction of queen cells. It also induces them to rear a greater number of queens, and as perfectly developed as if raised to supply natural swarms.

The importance of an efficient mode of raising queens to supply colonies is well understood by practical apiarians, and has been discussed by "Langstroth on the Honey Bee," also the celebrated Huber, in his book on the Honey Bee. And since the introduction of the various movable frames for hives, it has become doubly important, in order to facilitate the increase of bees by dividing the colony, or forming artificial swarms; also, to supply hives known or supposed to be queenless.

It seems necessary in the economy of the bee to suspend the

queen cells perpendicularly. In doing this from worker cells occupying a horizontal position, the queen cell is frequently projected beyond the comb to which it is attached, as shown in Plate No. 3. Also in Langstroth's work, at p. 192, and comes in contact with the comb adjoining, thereby endangering, and often fatally injuring, the queen cells in removing the comb.

But the most serious objection to these overhanging queen cells is the curved position in which the queen is reared, rendering her development frequently imperfect; also, when bees are, by the removal of their queen, compelled to rear young ones, they frequently construct the cells near the edge of the combs, and barely within the cluster of the bees, thus exposing them to chill, whereby they are often destroyed.

These difficulties are fully overcome by the use of the vertical QUEEN NURSERY, as per patent, granted to me, and dated December 13th, 1859: "Patent No. 26,431. Improvement in BEE HIVES. What I claim as my invention and desire to secure by letters patent is, placing the bee comb known as worker cell, in a horizontal or nearly horizontal position, so that the cells shall be vertical or nearly vertical, instead of horizontal, by the means or their equivalent substantially, as set forth and represented.

JOHN S. HARBISON."

P. S. I hereby tender to all ministers of the gospel and editors of newspapers throughout the United States, the right of the above for their own personal use, free of cost.

In order to enable others to construct and use said invention, together with its practical application, I have embodied in the following pages full directions for the same, and annexed a license entitling the purchaser to the personal use and benefit, on the terms therein set forth.

J. S. H.

AN IMPROVED SYSTEM OF PROPAGATING THE HONEY BEE.

FORMATION OF COLONIES.

THE proper time to commence colonizing is from one to two weeks earlier than natural swarms leave the parent hive, and to continue two months.* This depends on the season, and varies in different localities; the nearest approximation to the time would be from eight to ten weeks from the times that they commence to carry in pollen from the willows and other sources of early pasturage, or as soon as *Drones* make their appearance in considerable numbers. In Sacramento and vicinity they commence to carry in pollen about the first of February; and the first swarms for the past three years have emerged from the first to the fifteenth of April. In Oregon and Washington Territory, the commencement of the swarming season is probably from three to six weeks later, while in the latitude of Los Angeles, California, it is from two to four weeks earlier.

* This is as late as it is safe to form them, unless there is abundant pasturage or feeding is resorted to, in which case colonies may be formed to do well as late as the middle of July; also, the number of colonies that should be made from a hive depends almost entirely on the amount and continuance of pasturage. For, while in one place an increase of one or two colonies is all that can be made, there are others where from five to eight can be made and all do well.

FRAME HIVES being alone well adapted for the purpose of colonizing, the directions hereafter given refers only to their use, yet the invention can be applied to all style of hives.

Suppose the owner of five hives of bees finds on the twenty-second day of March, that his bees are becoming crowded in the hives, and from the favorableness of the season, believes they would swarm early in the following month. Then let him proceed to make a primary divide,* and form a Queen Nursery in the queenless division. For this purpose, choose one of the hives that is strong and likely to have the most brood. (There should be at least five sheets of comb containing brood in the hive selected for this purpose.)

If the hives used have their frames suspended from rabbets at the top as the Langstroth Hive, then remove the cap, also the honey boxes and honey board. If the frames are glued fast with propolis, they are to be pried loose, and are then to be moved each a little towards one side, in order to make room for taking out the first frame. But if the frames are inserted from the side and held adjusted by means of tenons and grooves, as the Harbison Hive, open the door and lid, remove the honey boxes, chamber floor, (honey board,) and glass frame. The operator should now stand with his left side close to the hive. The front tenons of four frames are first to be raised out of the grooves in the front board; then move three of them further from the side one to give space for it to be removed first. Then with the left hand take hold of the corner of the frame resting against the front

*One primary divide with queen nursery formed, can be depended on to supply from four to eight embryo queens. I have had as high as fourteen in one section, and frequently nine to eleven, and as high as twenty in a hive. The number depends mainly on the proper arrangement of the comb, the age of the eggs and larvæ, as well as a numerous family of bees and abundant pasturage.

board, and with the right hand the outer corner. Now raise the left hand, carrying the frame upwards and outwards, moving on the fulcrum, until free from its rest in the sill. The movements should be slow and gentle, yet no time should be unnecessarily wasted. Now place this frame in an empty hive ready at hand, then take hold of the second frame in the same manner as before described, and turn the comb with the left hand sufficiently to keep it from rubbing the bees and adjacent comb, then by the upward and outward movement it is freed from its rest (without jar,) the same as the first one — each of the other frames are removed in the same manner, part being placed in the hive with the previous one, and the others are to be stepped over into the vacancies first formed.

FIND THE QUEEN.

A sharp watch is to be kept for the queen from the first opening of the parent hive, and if found, place her in the new hive, but if not found by looking the combs once over, then spread a sheet on the ground and take the combs, one by one, and with a quick motion shake the bees on it. In handling combs, care should be taken to keep them with one edge upright to prevent breaking. The Queen will most likely be found in the cluster on the sheet, sometimes she crawls off the combs and is found on the inside of the hive.* When found, place

* Sometimes it is difficult or requires too much time to find the Queen among so large a mass of bees as should occupy a hive suitable for a primary division, in which case divide the combs so that about half of the brood as well as half of the bees are given to each hive. (Regard should also be had to a division of stores.) However, before adjusting the combs to their places, sections of combs should be arranged in each hive, as directed at page 8. This is necessary, as it is not known which hive the Queen is in. The one she is in will not build any Queen cells, while the other one will. Hence, on opening either hive after three days have elapsed, her whereabouts is readily determined.

her in the new hive, then examine the combs and choose one half of the most mature brood combs and place them in the hive with the Queen. One sheet of comb containing stores should be placed first at the side and the brood placed compactly adjoining. The empty frames are added, and the hive is ready to receive its share of the bees.

QUEEN NURSERY FORMED.

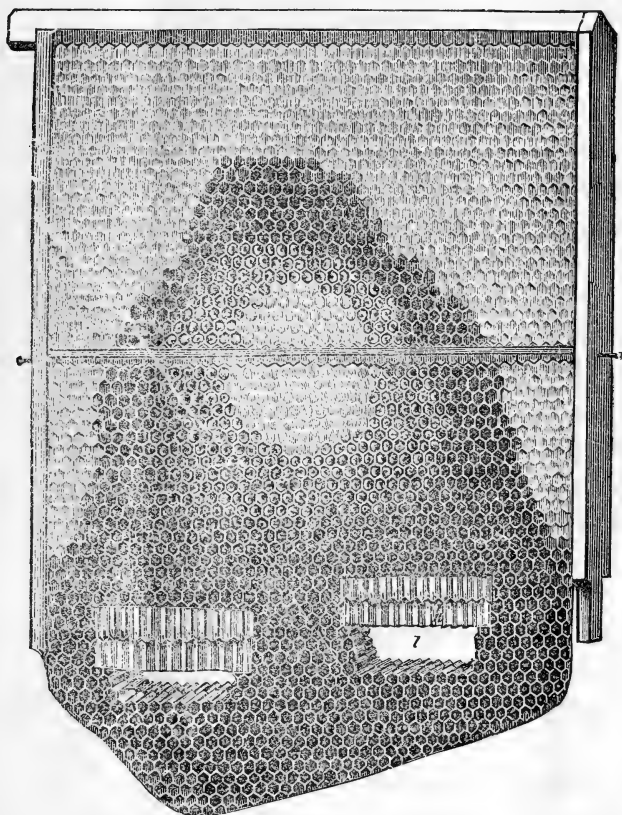
The other half of the brood combs, in which are principally eggs and young larvæ, together with the remainder of the store combs, is to occupy the original hive after the vertical Queen Nursery is formed, as follows: Take a comb newly built* and choose that portion of it in which eggs and a small portion of newly hatched larvæ is found, and with a knife cut out from the central portion of one or two sections, as shown in Plate No. 1.

H is one of the sections which is cut three inches long and seven-eighths of an inch deep. The ends are cut square, then three-eighths of an inch from either end cut down three-fourths of an inch, and take out the piece, leaving a shoulder three-eighths broad on either end for the section or nursery to rest upon. This being placed with the mouths of the cells downwards or ver-

*As it is sometimes difficult to find a newly built comb sufficiently large for turning the section in the same, it answers equally well to cut the apertures in old comb and insert sections of new built comb containing eggs taken from any other hive. In the spring of the year it would be necessary in order to get new comb, to remove a sheet of the old or a portion thereof, from the center of the hive about ten days before making the primary division; this would give the bees room to build, which they would do, provided they were strong and the pasturage good. The reason why new comb is best for rearing Queens in is, the absence of cocoons, on which account the bees build a much larger number than they do when compelled to use the cells containing cocoons. Eggs laid by a Queen one year old are better for rearing Queens from than those laid by one bred the same year.

tically, as shown in the figure, leaving a space, as shown at *i*, which gives room for developing Queens in a perfectly straight and natural position two combs should be so prepared, then a store comb is first placed at one side of the hive and the combs prepared as above, placed

(Plate 1.)



next to it and the balance of the brood, and then the store combs next to these, in a compact manner; an empty frame is added, and the whole covered with a cloth which reaches over the top and down the sides to the bottom board.

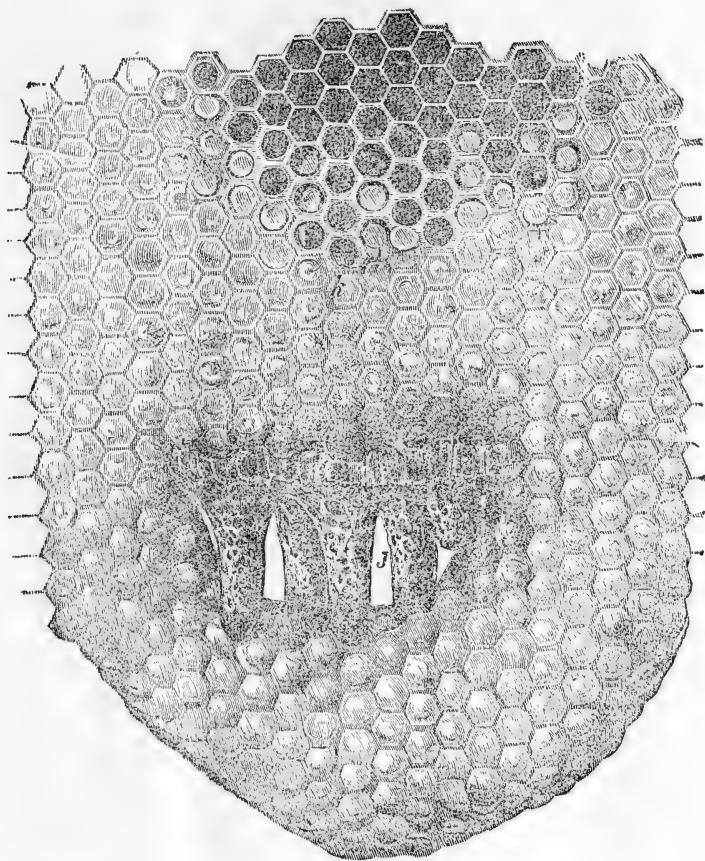
THE BEES ARE NOW TO BE EQUALLY DIVIDED between the two hives, and the glass frame and honey board put to their place, and the hives closed up and the apertures arranged for the egress and ingress of the bees. The hives are then to be placed; the one on the right and the other on the left side of where the original one stood, and may be placed within a few inches of each other.

THIS PRIMARY DIVIDE *is best performed in the evening*, about one hour before sundown, yet it will do at any time of day. They should be watched for the first few hours that they fly, to see that a proper proportion of them enters each hive. If more are found to enter one than the other, move the one that most enters further away and the other nearer to the place where the original hive stood; if this still does not effect the object, close the entrance of the strong one for about two hours and force the remaining bees to enter the weak one. When the apertures are again opened, a board or cloth may be placed so as to change the appearance of the one receiving more than their share of bees.

THE BEES *now finding* themselves without a Queen, but in possession of the means to rear young ones, quickly commence to enlarge and build downwards a number of the cells containing eggs, at the same time the young larvæ is supplied with a quantity of whitish matter, called royal jelly, which is of a slightly acid, pungent taste, and is different from the food on which the common brood are fed. These royal cells are sealed, a part of them on the sixth, and the balance on the seventh day from the time of forming the nursery. When the cells are finished, they present the appear-

ance shown in Plate No. 2. The Queen cells are shown at *j*, the worker brood emerging as seen at *k*. The

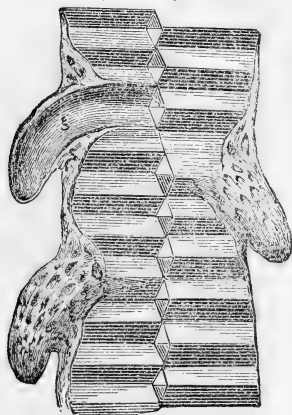
(Plate 2.)



Queen cells are straight and occupy a pendent position. The Queens are larger and more perfectly developed, and a greater number are reared by this method than when the colony is left to rear them as shown in Plate No. 3. *G* is the Queen cells being built outwards and downwards, so that the young Queens grow in a curved position; this being an unnatural shape, the Queen is

not as large or well developed as when raised in straight cells, as previously shown.

(Plate 3.)



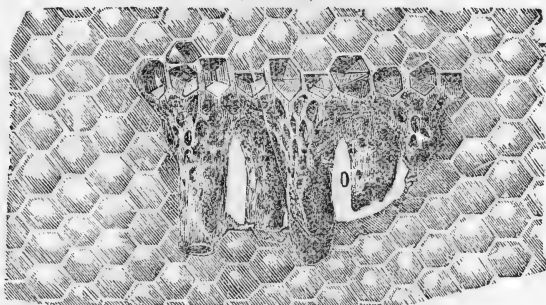
When Queen cells are built on the edge of a comb (as is often the case,) they frequently suffer from cold, which retards, and in many cases entirely destroys them. This danger is avoided by the vertical nursery being arranged so that it occupies the center of the cluster of the bees, by which means a chill is avoided.

The bees seldom if ever remove an egg from one cell to another for the purpose of development; hence it is obvious that they are seldom in a position suitable for straight cells, unless so arranged by the bee-keeper. This plan is also found to produce more and as perfectly developed Queens as if raised to supply natural swarms.

DATE THE HIVE containing the Queen Nursery with the day it was formed, in a conspicuous manner, and in ten days from this time the most advanced of the embryo Queens are sufficiently mature to be used in colonies now to be formed, or given to hives supposed to be queenless. The less advanced ones can be used on the

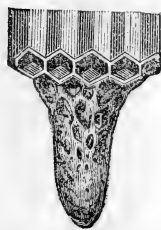
eleventh day. But it is not safe to let them remain for a longer period, as the first young Queen out would destroy the remaining ones. (See Plate No. 4.) *N* is the cells whence a Queen has emerged; *o* cells destroyed by her.

(Plate 4.)



WHEN the royal cells are mature, as above described, select a hive that is strong and filled with brood in all stages, open it and remove the combs in the same manner as directed in the primary division, then choose two combs, one of which should contain a large amount of mature brood and the other eggs and young larvæ.

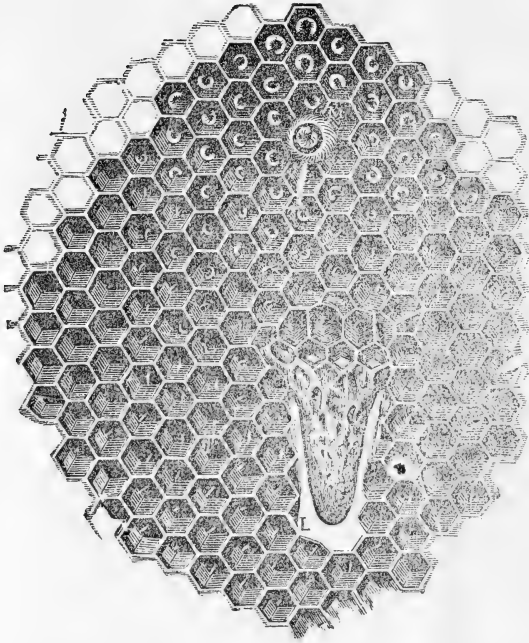
(Plate 5.)



A Queen cell is taken from the nursery, (see Plate No. 5.) Now with a knife make an aperture in the center of the comb having eggs, etc., and insert the Queen cell in it, (see Plate No. 6,) which shows the appearance of the comb with the Queen cell in it after being in the colony two days.

At *m* is seen the foundation of a new Queen cell which contains larvæ; this the bees commence and continue to build until the emerging of the supplied embryo Queen; and in case the latter fails, then this one supplies the loss. Care must be taken in handling the cells not to jar or dent them, also not to expose them so as

(Plate 6.)



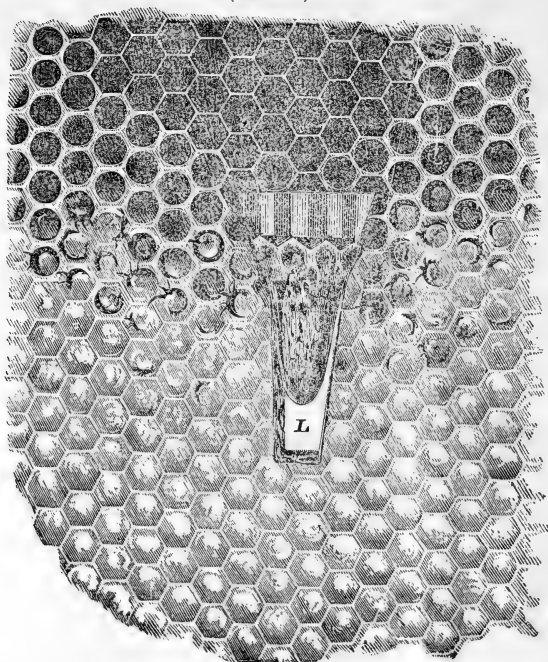
to become cold. And they should be so arranged as not to come in contact with the adjoining comb. Let the bees remain clustered on the combs, but if they are in the way of inserting the Queen cell, brush them gently with a quill out of the way. Watch carefully for the Queen, and if found, return her to the hive whence she was taken. The two combs containing brood (in one of which is the Queen cell,) are to be placed in a hive ready at hand,* and at one side, then one comb containing stores is added, together with an empty frame. There being three combs taken out of

* The hives should be cool at the time the colonies are placed in them, and particular care taken to shield them from the rays of the sun until they have their liberty. In fact, the sun should be excluded from the hives entirely, when the temperature is above seventy-five degrees. In early spring and at times when a low temperature prevails, it is best to let the sun shine directly on the hives, which will give greater vitality and assist in developing the brood.

the old hive, there should also be one-third of the bees taken to compose the new colony. Now cover the frames with a cloth. The hive is then closed, and the apertures shut, to prevent the escape of the bees. The ventilators are then opened and the hive set in a cool and shaded place till evening, when it is to be moved to a distance of one mile or more, when the apertures for the bees' entrance are to be opened, giving them their liberty.

THE *vacancy in the old hive* is filled with empty frames and then closed up, except the place for egress. If it is intended that the colony is to remain in the apiary where formed, instead of removing it to a distance, it is to be formed the same as above, except that both combs should contain mature brood instead of eggs and larvæ; the Queen cell should be inserted in the center of the comb where a portion of the brood have emerged, as shown in Plate No. 7. The young bees are also to be separated from the old ones.* This is done by shaking them from the combs on a sheet, the old ones take wing and return to the parent hive, while the young ones remain on the sheet. One-third of the bees should remain and be put in the new hive having the combs as previously arranged; before putting the bees in the hive, they are to be examined to find if the Queen is among them, and if found, return her to the hive from which she was taken.

*During the season of rapid breeding, which is in the spring and early summer, bees that are in a thrifty condition and have a fertile Queen, are found to have eggs and brood in all stages during a greater portion of the year, but they usually occupy a large proportion of their combs with a generation of nearly the same age. Hence when they emerge, the hive is in a fit condition to form colonies from as above; while if delayed a few days later, these young bees will have marked the exact position of their home, consequently, if afterwards taken to form colonies and are left in the same apiary, will, when they take wing, return to the familiar spot.



THE HIVE CONTAINING THE COLONY is then to be closed up, and with the ventilators open, set in a cool place as above directed. As soon as it is dark it should be set on the stand and the apertures opened for the working of the bees. Do not open the door or remove the frames for the first six days, for if done, many of the bees will take wing and return to the parent hive. By this time the Queen and most of the brood have emerged from the cells. The hive is then to be opened and all the bees are to be shaken or brushed from the two brood combs, which are now nearly empty. If many bees are found, proceed as follows: open any strong hive and choose two or three combs, (according to the strength of the colony they are to be placed in,) having eggs and young brood. All the bees are to be gently

brushed from the combs with a wing or quill. Then after one comb containing ample stores is placed in one side of the hive containing the colony, the former are to be placed adjoining with two empty frames added, and the whole covered with a cloth and the hive closed, except the apertures for egress and ingress.

THE TWO combs taken from the colony are put in the hive in exchange for the brood combs removed.* But if the colony is found to be weak, choose two combs with mature brood instead of eggs and young brood. From six to ten days after this last change, the colony will be found to have a fertile Queen,† or if the first embryo Queen has failed, sealed Queens will be found in the combs. If found to have a fertile Queen, the organization is complete and all that is wanted afterwards is to add empty frames or suitable combs, and see that the combs are built straight.

COLONIES FORMED and left in the same apiary do not work much for the first week; this is owing to the fact that the bees are too young to go forth to labor in the fields. As there is but little labor to be performed in the hive, all that is wanted is to maintain the animal heat to develop the brood. On the sixth day, when the combs are exchanged as directed, they will have commenced work. Receiving young brood at this time, stimulates them and gives them profitable employment. And having a young Queen, before they commence comb

*The objects of interchanging combs are 1st, to strengthen the colony. 2d. If the embryo Queen supplied has failed to emerge or is afterwards lost, it gives the bees the means of rearing another. 3d. The combs which would otherwise remain empty for a period of ten days, is immediately replenished with eggs, making a difference of half a generation's increase. And still another advantage gained by interchanging is the keeping the bees in the colony as profitably employed in maturing the brood as if they were in possession of a fertile Queen.

†Twenty-three days is the shortest time, and twenty-eight is the extreme limit for a Queen to become fertile from the time she is hatched from the egg.

building, (which they do about this time,) they build worker cells, most of which are supplied with eggs as soon as the Queen becomes fertile.

The hive containing the *Queen Nursery* having a large amount of mature workers, will build drone comb during the time they are queenless, but as soon as a Queen emerges they change and build worker comb, at which time the drone comb should be removed. But the hive having the old Queen continues their labors with increased vigor and fill up the vacancy mostly with worker comb, using it both for breeding and laying up stores.

THE ADVANTAGE *gained by moving* colonies to a distance as previously directed, are these, *first*, it saves time, there being no need of separating the young bees from the old, being moved such a distance as to prevent their returning to the parent hive, which many of them would do if formed and left in the same apiary.

Second. The colonies can be placed some distance apart, obviating the danger of the young Queen entering the wrong hive, as is frequently the case when packed closely on the stands. When the Queens become fertile, these colonies may be returned to the original apiary and placed in compact order without serious disadvantage. When formed as described above, it is safe to remove colonies a distance of from one to ten miles in a spring wagon, if deferred until the cool of the evening or morning.

THE HIVE CONTAINING *the Queen Nursery* having a large amount of bees, is suitable to divide on the tenth day from its formation. The combs from which the brood has emerged should be changed for combs having young brood. But no more should be placed in any

hive than there are bees to cover, so as to prevent a chill. Divide equally, giving a royal cell to each. The hives are to be properly arranged, to allow egress and ingress, and placed near each other, one on the right and the other on the left of the original position; these subdivisions are to be treated in the same manner as directed for other colonies.

ALL COLONIES *having young Queens* about to emerge and standing in the immediate vicinity of other hives, should be conspicuously marked, to enable the young Queen to regain her own home on returning from her ærial amorous excursions. This takes place within from seven to ten days from her birth. The marking is best done by placing a board, one end resting on the place of alighting and the other on the ground in a slanting position. When a number of colonies are to be thus marked, let the boards be of different colors. Cloth can be used to good advantage to alternate.

AS SOON *as the Queens are fertile*, let these marks be removed; this will show at a glance if any remain unfruitful.

To build up weak colonies at any time, take a sheet of mature brood from any hive that is full, and give to them; being sure to have all hives full of comb and stores at the close of the season.

THE CALIFORNIA BEE HIVE

Was patented January 4th, 1859, to J. S. Harbison.

THE above Hive was awarded the first premium at the California State Fair, held in Marysville in 1859. The first premium was also awarded at the Industrial Exhibition of the Mechanics' Institute of San Francisco for the same year.

The following extract is from the Report of Special Com-

mittee, No. 24, on Bee Hives, published in the *Transactions of California State Agricultural Society for the year 1859* :

"We would next report in reference to Mr. Harbison's Hive. This Hive is a California invention, and combines the great requisites necessary to the successful raising of Bees, namely: having perfect control of the combs, by means of the sectional frame, which is so adjusted that it is firmly held at proper fixed distances, and can be removed without the least jar; it also has the inclined bottom, and there are no useless parts to form a harbor for worms, or accumulation of filth, to facilitate their increase.

"While the Hive is constructed on natural principles, giving proper depth of comb, enabling the Bees to concentrate the animal heat to the best advantage, thereby insuring a large increase of Bees, and consequently of honey, the ventilation is on a new principle, so arranged as to admit air without light, when required, and be reduced or increased easily.

"The surplus honey-box is made in sections, so that while the largest yield of honey is obtained, it is yet separated in small parcels, in a beautiful shape for the table.

"Your committee award to the Harbison Hive the first premium; and also would recommend to the Executive Committee that they award him a special premium for his ingenious invention of so useful an article in our State."*

For Hives, Individual, Township, County or State, Rights for the above Hive in all the States and Territories (except those hereafter named,) apply either to W. C. HARBISON, Chenango, Lawrence Co., Pa., to A. STEWART, Fallston, Beaver Co., Pa., or to the undersigned.

In the State of Iowa, to J. H. DICKEY, Bellvue, Jackson Co., Iowa.

In the State of Michigan, Indiana and Kentucky, to A. F. MOON, Paw-Paw, Van Buren Co., Michigan.

In New Jersey, or adjoining territory, to GEORGE HENRY HAMMONTON, Atlantic Co., N. J. In Kansas Territory, to JOSEPH P. LOCKEY, Spring Hill, Johnson Co., Kansas.

In Oregon and Washington Territories, and Siskiyou Co., California, to W. C. MYER, Ashland Mills, Jackson Co., Oregon, or the undersigned.


HIVES and RIGHTS are also for sale by the following Agents in California:

Thomas Ogg Shaw, San Francisco; Samuel Morrison, Santa Clara; C. C. Warner, Stockton; E. A. Sherman, Los Angeles; Jacob V. Hoag, Washington, Yolo Co.; B. H. Hoag, Napa; E. W. Winchell, Millerton, Fresno Co.; G. W. Ramsdell, Marysville; Blewbaugh & Harris, Folsom; James Clark, Ione City.

J. S. & W. C. HARBISON.

SACRAMENTO, Cal.

* Since the above was in type, the first premium has been awarded to this hive at the District Fairs held respectively at Marysville and Stockton.

 *Persons wishing to procure Bees to commence the business of Bee Keeping, will do well to visit different Apiaries, and thus by comparison be able to select choice stocks to the exclusion of all others.*

THE
BEE KEEPER'S
DIRECTORY

IS THE TITLE OF

An Illustrated Work on Bees,

Which I am now preparing, and expect to have published within the present year. The delay in the publication of the above work, which was promised early in the season, has been caused by a temporary loss of my health, which is now in a measure restored.

J. S. HARBISON.

SACRAMENTO, SEPT. 1860.





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